

HISTORY OF SCIENCE 323 / HISTORY 323
The Scientific Revolution: from Copernicus to Newton
Spring 2010
2:30-3:45pm TuTh
B231 Van Vleck

instructor: Florence Hsia
office: 229 Bradley Memorial
office hours: 11:00-1:00pm Tuesdays & by appt.
phone: 262-3971
email: <fchsia@wisc.edu>

COURSE DESCRIPTION

This course investigates the renaissance and revolution in European science that began in 1543 with the heliocentric astronomy of Nicolaus Copernicus and ended with Isaac Newton's death in 1727. We will pay particular attention to issues of tradition and novelty, institutional settings for scientific activity, and the relationship between science and religion. Topics covered will include the Copernican cosmology and the trial of Galileo, the mechanical philosophy, Newton's theory of gravitation, the appearance of new scientific organizations such as the Royal Society of London and the Paris Academy of Sciences, the role of science in European exploration and expansion, and perceptions of the scientist's place in society.

This class also emphasizes the skills of analyzing historical documents and of constructing persuasive arguments about historical questions. It is therefore extremely important that you complete the readings assigned for each class session before coming to class. Please bring the readings – especially those in the Course Reader – to class with you.

COURSE REQUIREMENTS AND GRADING

1. Attend classes.
2. Prepare assigned readings.
3. Grades will be based on one (1) in-class group presentation and three (3) take-home essay exams. Grades will be calculated using the following rough guidelines:

one in-class presentation, March 9/11	~25%
exam 1 due in class, March 2 (Tu)	~25%
exam 2 due in my mailbox, April 22 (Th)	~25%
exam 3 due by 10:00AM, May 15 (Sat)	~25%

Honors students need to complete an honors assignment. Please see me for details.
Graduate students should also enroll in History of Science 623 (for assignments, see the HoS 623 syllabus.)

COURSE POLICIES

I will make every effort to honor requests for reasonable accommodations made by individuals with disabilities. If you think you may qualify for accommodation, please contact the McBurney Disability Resource Center at 263-2741 (<http://www.mcburney.wisc.edu/>) to establish your eligibility for services. If you require such accommodation, please let me know as soon as possible in the semester. All requests are confidential.

Academic honesty is expected of students at the University of Wisconsin-Madison in compliance with the student code of conduct. All written work that you turn in under your name should be solely your work. Both paper and internet sources must be acknowledged; failure to understand what counts as plagiarism is not an adequate excuse. Plagiarism and other forms of academic misconduct carry penalties. Feel free to talk to me if you have any questions about how to properly cite sources in your written work. You can also consult the Writing Center's guide to quoting sources (<http://www.wisc.edu/writing/Handbook/QuotingSources.html>).

TEXTBOOKS

- Course Reader (purchase at the History of Science dept. office, 210 Bradley Memorial; no returns)
- Peter Dear, *Revolutionizing the sciences*, Princeton 2001 (purchase at the University Book Store, 711 State Street)

All textbooks may be consulted on reserve at the College Library, Helen C. White Hall.

SCHEDULE OF ASSIGNMENTS AND TOPICS

CR = Course Reader

D = Dear, *Revolutionizing the sciences* (2001)

Jan 19 (T)	introduction
Jan 21 (Th)	scientific renaissance CR, 1-26 Vesalius, <i>On the fabric of the human body</i> (1543), selections D, 1-9, 30-33, 37-41 [intro + chap. 2, sections I + III]
Jan 26	the Aristotelian cosmos CR, 27-30 Aristotle, <i>Physics</i> , book II, selections D, 10-15 [chap. 1, section I]
Jan 28	the Greek cosmological tradition CR, 31-36 diagrams; Ptolemy, <i>Almagest</i> , bk. I, chaps. 2-4
Feb 2	the Greek astronomical tradition CR, 37-41 Ptolemy, <i>Almagest</i> , book I, chap. 7; planetary models
Feb 4	the renaissance in astronomy CR, 43 Peurbach, <i>New theoric of the planets</i> (1475), illustration D, 15-24, 33-37 [chap. 1, sections II-III + chap. 2, section II]
Feb 9	heliocentrism CR, 45-57 Copernicus, <i>On the revolutions</i> (1543): 'To his holiness' + bk. I, intro + chap. 10; diagrams D, 33-37 [chap. 2, section II]
Feb 11	responses to heliocentrism CR, 45-46, 59 Copernicus, <i>On the revolutions</i> (1543), prefatory matter; Tycho Brahe material D, 41-45, 74-78, 101-104 [ch. 2, section IV; ch. 4, section III (Kepler); ch. 6, section I]
Feb 16	heliocentrism CR, 61-76 Kepler illustrations; Galileo, <i>Sidereal messenger</i> (1610) + diagrams D, 65-73 + 104-8 [ch. 4, sections I-III + ch. 6, section II]
Feb 18 (Th)	the Galileo affair (I) CR, 77-84 timeline; Castelli-Galileo letters (1613) Council of Trent decrees
Feb 23	the Galileo affair (II) CR, 85-91 Bellarmine-Foscarini letter (1615); inquisition documents (1616) + Vatican letters (1631) Galileo, <i>Dialogue on the two chief world systems</i> (1632)
Feb 25 (Th)	Special Collections: introduction (meet in Memorial Library)
Mar 2 (Tu)	Special Collections: Sacrobosco (meet in Memorial Library) / Exam 1 due in class
Mar 4 (Th)	Special Collections: group project (meet in Memorial Library)
Mar 9 (Tu)	science in print (I): class presentations (meet in Memorial Library)
Mar 11 (Th)	science in print (I): class presentations (meet in Memorial Library)

- Mar 16 **the skeptical crisis**
CR, 109-112 Descartes, *Discourse on the method* (1637), selections
CR, 131-143 *Of two wonderful Popish monsters* (1586), selections
 Paré, *On monsters and prodigies* (1573), selections
D, 80-84 [ch. 5, section I]
- Mar 18 no class meeting
- Mar 23 **the Baconian project**
CR, 144-154 Bacon, 'Preparative' (1620)
D, 57-64 [ch. 3, sections III-IV]
- Mar 25 **the culture of curiosities (Neil Kenny guest lecture)**
- March 30/April 1 **spring break**
- April 6 **experimentation**
CR, 155-175 Galileo, *Dialogue on the two world systems* (1632)
 Boyle, 'New experiments' (1668)
D, 131-45 [ch. 7, sections I-III]
- April 8 **mechanical philosophies**
CR, 113-114 Descartes, *Principles of philosophy* (1644/1647), #203-207
D, 84-86 [ch. 5, section II]
- April 13 **the Cartesian world**
CR, 115-120 Descartes, *The world* (1633/1677), ch. 5-7
D, 86-100 [ch. 5, sections III-VI]
- April 15 **the Newtonian world**
CR, 121-126 Newton, *System of the world* (1685), selections
 Newton, *Opticks* (1706/1717), Query 31, selections
D, 149-63 [ch. 8, sections I-II, esp. section II]
- April 20 **Newtonianism**
CR, 127-130 Newton, 'General Scholium' (1713)
D, 163-67 [ch. 8, sections II-III]
- April 22 (Th) *Philosophical transactions* online exercise / **Exam 2 due (my mailbox)**
CR, 93-108 *Philosophical transactions* 1 (1665): 1-16
- April 27 **science in print (II): class discussion**
April 29 **scientific societies (I)**
CR, 179-191 Woodward, *Brief instructions* (1696)
D, 111-23 [chap. 6, section IV]
- May 4 **scientific societies (II)**
CR, 193-200 Cassini, 'Voyages to Cape Verde' (1684)
CR, 201-225 Tachard, *A relation of the voyage to Siam* (1688), selections
D, 111-30 [chap. 6, sections IV-V]
- May 6 **science and society**
CR, 227-252 Bacon, *New Atlantis* (1627), selections;
 Swift, *Gulliver's travels* (1735), part 3, selections
- May 15 (Sat) EXAM 3 due Saturday, May 15, by 10:00AM**

